

Disseminated tuberculosis in a newborn infant

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ABSTRACT

Tuberculosis (TB) remaining as one of the deadliest communicable diseases. Congenital infection by vertical transmission is rare but high neonatal mortality (up to 60%) and morbidity warrant early and accurate diagnosis of newborns suffering from TB. Intrauterine infection of tuberculosis is most commonly caused by haematogenous spread from the mother causing placental seedling. The organisms reach the fetus via the umbilical vein and the primary focus is often in the fetal liver in hematogenous spread. Another route of infection is by direct ingestion or aspiration of infected amniotic fluid if the placental caseous lesion ruptures directly into the amniotic cavity. Transplacental infection occurs late in pregnancy and aspiration from amniotic fluid occurs in the perinatal period. We report here one case of disseminated tuberculosis in a new born infant.

Keywords: Congenital tuberculosis, diagnosis, management, transmission

Introduction

Tuberculosis (TB) remains as one of the deadliest communicable diseases accounted for 9 million infections in 2013. Although it is more common in man than woman, an estimated 510,000 women died as a result of TB in 2013.^[1] Congenital infection by vertical transmission is rare but high neonatal mortality (up to 60%) and morbidity warrant early and accurate diagnosis of newborns suffering from TB. Intrauterine infection of TB is most commonly caused by hematogenous spread from the mother causing placental seedling. The organisms reach the fetus via the umbilical vein, and the primary focus is often in the fetal liver in hematogenous spread. Another route of infection is by direct ingestion or aspiration of infected amniotic fluid if the placental caseous lesion ruptures directly into the amniotic cavity.^[2] Transplacental infection occurs late in pregnancy and aspiration from amniotic fluid occurs in the perinatal period. We report here one case of disseminated TB in a new born infant.

Case Report

A 20-day-old male child admitted to the pediatric casualty of Guru Teg Bahadur Hospital (GTBH) on April 16, 2014 with the complaints of fever, decreased appetite, and rapid breathing since morning. The baby was apparently healthy 1 day back, but suddenly he developed fever which was mild grade 101°F since morning. There was no history of vomiting, loose motions, abnormal movements, bleeding etc. Baby had normal vaginal delivery in GTBH on March 27, 2014 to the second gravida mother at 34 weeks of pregnancy and cried immediately after birth. There was no history of perinatal asphyxia. Baby was breast feed till April 5, 2014 after which baby was given top feeds. On examination, weight of the baby was 1.8 kg. Bacillus Calmette–Guérin mark was seen. Child appeared sick with poor activity. Respiratory system examination revealed respiratory rate of 48 breaths/min with normal air entry bilaterally. Other systemic examinations revealed mild hepatosplenomegaly. On investigation, his complete blood count showed total leukocyte count 22,200/cumm with 68% neutrophils and platelet count 91,000/cumm, hemoglobin was 15.6 g/dL. Serological investigations for HIV, HBsAg, toxoplasmosis, cytomegalovirus, and herpes virus 1 and 2 were negative. Liver enzymes were

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slightly elevated. His cerebrospinal fluid (CSF) study and culture was suggestive of tubercular meningitis. Gastric aspirate was positive for acid-fast bacilli (AFB) on 3 consecutive days. Chest radiography showed miliary shadows in both sides of the lung. There was no growth in both aerobic and anaerobic blood culture. All other tests were negative. Antenatal history of mother revealed leaking per vagina for 15 days prior to delivery. Mother suffered from cough at the 8th month of pregnancy and was diagnosed as a case of pulmonary TB. Her sputum was positive for AFB on both spot and morning samples. Endometrial biopsy was not performed, and she was nonreactive for HIV. She was started on antituberculosis treatment (ATT) on April 8, 2014. Mother recalled the previous history of pleural effusion 1 year back, but sputum samples were not taken during that time and ATT was not initiated. On the basis of above findings and maternal history, the baby was diagnosed as a case of congenital disseminated TB and baby was given injection monocef on the 1st day then later on started with isoniazid, rifampicin, and pyrazinamide along with amikacin for 12 months and advised to come every month for monitoring treatment outcome. The baby's gastric aspirate was AFB-negative and chest X-ray showed few military shadows after 8 months of therapy. Treatment continued till 12 months and X-ray was done again at the end of treatment, which was normal.

Discussion

Congenital TB may be difficult to distinguish from other neonatal or congenital infections from which similar symptoms may arise in the 2nd to the 3rd week of life. Cantwell *et al.* proposed the diagnosis of congenital TB in the presence of proven tuberculous disease in mother and at least one of the following: (i) lesions in the newborn baby during the 1st week of life, (ii) a primary hepatic complex or caseating hepatic granulomata, (iii) tuberculous infection of the placenta or the maternal genital tract, and (iv) exclusion of the possibility of postnatal transmission by investigation of contacts, including hospital staff.^[3] Morphological and histological examination of placenta at the time of delivery are very useful and source of infection can be identified by screening of household contacts. Radiographic abnormalities in liver usually appear later.^[4] Therefore, microbiological investigations for TB should be done in the setting of poor response to antibiotics and supportive therapy.

Sample collection is quite difficult in neonates, suitable specimens should be collected for microscopy and culture to yield better result, which include gastric aspirates, sputum (induced), tracheal aspirates (if mechanically ventilated), skin lesions, ear discharge, ascitic fluid, CSF, and pleural fluid (if present) for AFB and culture). Bronchoalveolar lavage (BAL) is a very good specimen and detection of *Mycobacterium tuberculosis* DNA in BAL fluid by polymerase chain reaction is diagnostic in newborn.^[5,6] Although microscopic examination of sputum or other specimen for AFB remains the cornerstone for laboratory diagnosis of TB in pregnancy, the percentage of new cases of smear-positive

TB detected ranged between 56% and 68%. Therefore, staining techniques alone not sufficient for the diagnosis of TB as smear-negative cases will be missed.^[7] The traditional culture on Lowenstein-Jensen's medium requires 4–6 weeks period to obtain a result. Light-emitting diode fluorescence microscopy and liquid-based mycobacteria growth indicator tube have been accredited by the WHO in developed countries for faster results. However, MTB/RIF may be used rather than conventional microscopy and culture as the initial test in all children suspected of having TB for the diagnosis of pulmonary and extrapulmonary TB in adults and children as per the WHO recommendations.^[8]

Treatment must be started as early as possible and therapy should be monitored, but frequency and modes of monitoring guidelines do not exist. Chest X-ray at the end of treatment is recommended by DOTS^[9] whereas the American academy of pediatrics suggested that infants who are on prophylaxis for TB should have clinical surveillance. No specific treatment regimens exist for congenital TB. Treatment includes isoniazid, rifampicin, ethambutol, and kanamycin, or amikacin for the first 2 months followed by isoniazid and rifampicin for 6–12 months.^[10] Our patient was also treated with isoniazid, rifampicin, pyrazinamide, and intravenous amikacin. Response to ATT drugs is usually good as in our case. Both smear and culture and chest X-ray revealed no infection at the end of treatment.

Congenital TB is still underdiagnosed and misdiagnosed even in endemic countries like India. Early diagnosis is critical to affect a favorable outcome. Screening of all suspected women during pregnancy in endemic countries is of utmost important to decrease the mortality rate. More studies should be done to emphasize the guidelines for diagnosis and management protocol in resource limited countries.

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Conflicts of interest

There are no conflicts of interest.

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